

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-20 and 22-25 are currently pending. Claim 21 has been canceled without prejudice; and Claims 8 and 19 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 1 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0137701 to Shimizu (hereinafter “the ‘701 application”) in view of U.S. Patent Application Publication No. 2003/0197794 to Sakata (hereinafter “the ‘794 application”), further in view of U.S. Patent No. 6, 278,526 to Kurozasa (hereinafter “the ‘526 patent”); Claims 2, 4, and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 and ‘794 applications, further in view of the ‘526 patent and U.S. Patent No. 6,278,513 to Murata et al. (hereinafter “the ‘513 patent”); Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 and ‘794 applications, further in view of the ‘526 patent and U.S. Patent No. 7,312,898 to Feng et al. (hereinafter “the ‘898 patent”); Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 and ‘794 applications, further in view of the ‘526 patent and European Patent Application No. EP 0926622 to Nishij et al. (hereinafter “the ‘622 patent”); Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 application, the ‘794 application, the ‘526 patent, and the ‘513 patent, further in view of Japanese Patent Publication No. 2000-196881 to Yoshiuki (hereinafter “the ‘881 patent”); Claims 9-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 application, the ‘794 application, the ‘526 patent, the ‘513 patent, and the ‘881 patent, further in view of the ‘622 patent; and Claims 21 and 25 were rejected under 35 U.S.C.

§ 103(a) as being unpatentable over the ‘701 application, the ‘794 application, the ‘526 patent, the ‘513 patent, the ‘881 patent, the ‘622 patent, and the ‘898 patent.

Claim 1 is directed to an image reproduction apparatus including an image copying function for reproducing input image data including image data obtained by reading a document, and for outputting the reproduced image data, the image reproduction apparatus comprising, (1) extension control means to which a controller board is connectable to add one or more optional units to realize one or more extension functions, the extension control means allowing operation control in the one or more extension functions to be performed in a same manner as in the image copying function, and allowing image data to be input/output in the extension functions in a same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions; (2) image quality retaining means for retaining a quality of an image reproduced via the extension control means at a level similar to that of an image produced by the image copying function; (3) operation control means for controlling operation of the image reproduction apparatus in a similar manner, regardless of whether the operation is associated with the image copying function or the one or more extension functions provided by the extension control means; (4) resource sharing means for allowing a resource used in the image copying function to also be used by the extension control means in inputting and/or outputting image data; (5) image input means for reading an image of the document and outputting image data of the document image; and (6) image input/output control means for controlling inputting/outputting of image data depending on an output characteristic of image data output from the image input means such that the image input means inputs/outputs image data in the same form.

Regarding the rejection of Claim 1 under 35 U.S.C. § 103(a), the Office Action asserts that the ‘701 application discloses everything in Claim 1 with the exception of the

extension control means and the image quality retaining means, and relies on the ‘794 application and the ‘526 patent to remedy those deficiencies, respectively.

The ‘701 application is directed to an image processing apparatus that includes a main controller 33, an I/O controller 51, and a network controller 42. As shown in Figure 3, the ‘701 application discloses a scanner interface 46 connected to a connector 56, as well as a printer interface 48 connected to a connector 59. In addition, the ‘701 application discloses an extended connector 50 that can be connected to other devices.

However, as admitted in the outstanding Office Action, the ‘701 application fails to disclose the image quality retaining means and the extension control means to which a controller board is connectable, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions, as recited in Claim 1.

The ‘794 application is directed to an image input apparatus that is capable of taking a still image, and including a video camera and an expansion board mounted on a personal computer. In particular the ‘794 application discloses that the expansion board is connected via a camera cable to the video camera, and that the expansion board includes a vertical interval data signal (VIDS) circuit 49, an A/D converter 39, and CPU 51. Further, the ‘794 application discloses that as the shutter release switch of video camera is depressed, the expansion board is controlled to read still image data and compress it, and that after the shuttle release switch is released, the expansion board is controlled to resume the initial operations of reading image data and compressing it. Further, as noted by the outstanding Office Action, paragraph [0076] of the ‘794 application discloses that the CPU 51 and the expansion board acts as a system controller for the expansion board, and that as part of this function, the CPU 51 periodically checks whether the VIDS circuit 49 has received data. Further the ‘794 patent discloses that, if it is determined that the VIDS circuit has received

data, a processing routine in the CPU 51 jumps to a step that executes the shutter interrupt process routine shown in Figure 10.

However, Applicant respectfully submits that the '794 application fails to disclose an extension control means to which a controller board is connectable to add one or more optional units to realize one or more extension functions, the extension control means allowing operation control in the one or more extension functions to be performed in a same manner as in the image copying function, and allowing image data to be input/output and the extension functions in a same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions, as recited in Claim 1. While the '794 application discloses an expansion board that includes a CPU that acts as a system controller, Applicant respectfully submits that the '794 patent is silent regarding an arbiter that arbitrates use of resources shared by the one or more extension functions. In particular, it is unclear to Applicant, and the Office Action does not indicate, how the '794 application discloses the one or more extension functions and the resources shared by the one or more extension functions recited in Claim 1. Further, Applicant notes that page 4 of the outstanding Office Action refers to a "judging means," but this element is not identified within the teachings of the '794 application. In this regard, Applicant notes that Claim 1 states that the controller board includes both a system controller and an arbiter, but that the '794 patent merely discloses a system controller.

Further, Applicant notes that Claim 1 states that the arbiter arbitrates use of resources shared by the one or more extension functions and that the extension control means allows operation control in the one or more extension functions to be performed in a same manner as an image copying functions, and allow an image data to be input/output in the extension functions in the same format as in the image copying function. In this regard, it is unclear to

Applicant now the '794 application discloses one or more extension functions and the relationship to the image copying function recited in Claim 1. In particular, Applicant respectfully submits that the '794 patent fails to disclose one or more extension functions and an arbiter that arbitrates use of resources shared by the one or more extension functions, as required by Claim 1. Rather, the '794 application merely discloses an expansion board having a CPU 51 that acts as the system controller for the expansion board.

The '526 patent is directed to an external computer that is connected to a main control unit of a copy machine via a control unit. In particular, the '526 patent discloses that the control unit reads programs from the ROM of the control unit for translating commands sent from the external computer and transmits the transmitted commands to the main control unit to perform a designated copy mode. Thus, the '526 patent discloses that the control unit itself performs data processing that cannot be performed by the main control unit so that various copy modes are available.

However, Applicant respectfully submits that the '526 patent fails to disclose extension control means to which a controller board is connectable, wherein the controller board includes a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions, as recited in Claim 1. Applicant notes the Office Action does not assert that the '526 patent discloses this limitation.

Thus, no matter how the teachings of the '701 application, the '794 application and the '526 patent are combined, the combination does not teach or suggest an extension control means to which a controller board is connectable, wherein the controller board includes a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions, as recited in Claim 1. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and the rejections of Claims 1 and 5 should be withdrawn.

Amended Claim 8 is directed to an image reproduction apparatus including an image copying function for reproducing input image data including image data obtained by reading a document and outputting the reproduced image data, the image reproduction apparatus comprising: (1) extension control means to which a controller board is connectable to add one or more optional units to realize one or more extension functions, the extension control means allowing operation control in the one or more extension functions to be performed in a same manner as in the image copying function and allowing image data to be input/output in the extension functions in a same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the one or more extension functions; (2) image quality retaining means for retaining a quality of an image reproduced via the extension control means at a level similar to that of an image produced by the image copying function; (3) operation control means for controlling operation of the image reproduction apparatus in a similar manner, regardless of whether the operation is associated with the image copying function or the one or more extension functions provided by the extension control means; (4) resource sharing means for allowing a resource used in the image copying function to also be used in inputting and/or outputting image data used by the extension control means; (5) line decimation control means for converting resolution of the image data; (6) pixel loss compensation means for compensating for a loss of pixel information caused by line decimation; (7) invalid pixel detection means for detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, prior to reading the image using the sheet-through document feeder; (8) streak image correction means for correcting the streak image; and (9) warning means for warning of an occurrence of the invalid pixel. Claim 8 has been amended to recite the controller board recited in Claim 1. Accordingly, no new matter has been added.

As discussed above, the combined teachings of the '701 application, the '794 application, and the '526 patent fail to disclose the controller board recited in Claim 8. Applicant further submits that the '513 patent and the '881 patent fail to remedy the deficiencies of the '701 application, the '794 application, and the '526 patent with respect to the controller board recited in Claim 1. Rather, the '513 and '881 patents are relied upon by the Office Action as disclosing the line decimation control means and the invalid pixel detection means recited in Claim 8.

Accordingly, for the reasons stated above, it is respectfully submitted that the rejection of Claim 8 is rendered moot by the present amendment to Claim 8.

Regarding the rejection of dependent Claims 2-4, 6, and 7 under 35 U.S.C. § 103(a) Applicant respectfully submits that the '513 patent, the '898 patent, and the '622 patent fail to remedy the deficiencies of the '701 application, the '794 application, and the '526 patent, as discussed above. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and the rejection of dependent Claims 2-4, 6, 7 should be withdrawn.

Amendment Claim 19 is directed to an image reproduction method of reproducing input image data such as that obtained by reading a document and outputting the reproduced image data, the method comprising, (1) controlling inputting/outputting of image data depending on an output characteristic of image data output from image input means such that the image input means outputs image data in a same form; (2) detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, prior to reading the image using the sheet-through document feeder; and (3) converting a data format of the image data such that outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data. Claim

19 has been amended to incorporate the limitations of recited in Claim 21. Accordingly, no matter has been added.

Applicant respectfully submits that the rejection of Claim 19 is rendered moot by the present amendment to that claim. However, since Claim 19 was amended to incorporate the limitations of Claim 21, Applicant will address the rejection of Claim 21 set forth in the outstanding Office Action.

Regarding the limitation added by Claim 21, the Office Action relies upon the ‘898 patent as disclosing the step of converting a data format of the image data such that outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data. In this regard, Applicant notes that the Office Action relies upon column 1, lines 6-13 of the ‘898 patent as disclosing this limitation. However, Applicant notes that that passage in the ‘898 patent merely discloses that digital senders support a variety of document types, a variety of document formats, and a variety of communication protocols. The ‘898 patent also discloses the TIFF, PDF, and JPEG formats. However, nowhere does the ‘898 patent disclose the steps of converting a data format of the image data such that the outputting of the image data is performed in a same manner regardless of whether the image data is color data or monochrome image data. Rather, the ‘898 patent merely broadly discloses various data formats and communication protocols. The ‘898 patent is silent regarding the color image data and the monochrome image data limitations recited in amended Claim 19.

Thus, no matter how the teachings of the ‘701 application, the ‘794 application, the ‘526 patent, the ‘513 patent, the ‘881 patent, the ‘622 patent, and ‘898 patent are combined, the combination does not teach or suggest the step of converting a data format of the image data such that the outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data, as recited in amended

Claim 19. Accordingly, Applicant respectfully submits that amended Claim 19 patentably defines over these cited references.

Independent Claim 22 is directed to an image reproduction method comprising: (1) reading an image; (2) detecting an invalid pixel from the image read in the reading step; (3) detecting a maximum width of invalid pixels detected in the step of detecting the invalid pixel; (4) detecting a number of invalid pixels detected in the step of detecting the invalid pixel; (5) detecting allocation, on a document, of each invalid pixel detected in the step of detecting the invalid pixel; (6) predicting an occurrence of a streak image in a document image from results of detection made in the step of detecting the maximum width, the step of detecting the number of invalid pixels, and the step of detecting the location of each invalid pixel; and (7) correcting the streak image in the document image based on a result of the prediction made in the predicting step.

Regarding the rejection of Claim 22, Applicant notes that page 19 of the Office Action refers to Claims 8, 10, and 13. In particular, regarding Claim 10, the Office Action asserts that the ‘881 patent discloses detecting sizes of invalid pixels and a total number of invalid pixels.

The ‘881 patent is directed to an image processor that optimizes read correction with a sheet-through document feeder and a press plate. In particular, the ‘881 patent discloses two read modes, a first read mode using the sheet through document feeder, and a second read mode using the press plate. In addition, the ‘881 patent discloses detecting a white stripe on a reference white board and detecting a black stripe by reading the background plate, and correcting these abnormalities.

However, Applicant respectfully submits that the ‘881 patent fails to disclose the steps of detecting a maximum width of invalid pixels and detecting a number of a invalid pixels, as recited in Claim 22.

In this regard, Applicant notes that page 15 of the outstanding Office Action states that the ‘881 patent discloses that invalid pixel detections are saved in memory and the size of the detected invalid pixels “can be known.” However, Applicant respectfully submits that the ‘881 patent does not actually disclose that detecting the maximum width of invalid pixels or detecting a number of invalid pixels is performed, as required by Claim 22. Rather, the ‘881 patent merely broadly discloses detecting white stripes and black stripes, which is not a disclosure of that the maximum width and the number of invalid pixels is used to predict an occurrence of a streak image, as required by Claim 22. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 22 should be withdrawn.

Independent Claim 23 is directed to an image reproduction method, comprising: (1) reading an image; (2) dividing the image into blocks with a predetermined block size; (3) detecting a total number of invalid pixels and a number of invalid pixels at successive locations in each block produced in the dividing step; and (4) detecting a blank document page by calculating a sum of the numbers detected for respective blocks in the step of detecting the total number of invalid pixels.

Regarding the rejection of Claim 23, Applicant notes that the Office Action refers to the rejections of Claims 8, 9, and 12. In particular, regarding Claim 12, the Office Action asserts that the ‘881 patent discloses that the invalid pixel detections “can be detected by blocks,” and refers to paragraphs 43, 44, and 49-52 in the ‘881 patent.

However, Applicant respectfully submits that the ‘881 patent fails to disclose detecting a total number of invalid pixels and a number of invalid pixels at successive locations in each block produced in the dividing step, and calculating a sum of the numbers detected for respective blocks in the step of detecting the total number of invalid pixels, as recited in Claim 23. As discussed above, the ‘881 patent broadly discloses detecting white

stripes and black stripes. The ‘881 patent does not actually disclose dividing the image into blocks and detecting the total number of invalid pixels in each block or the number of invalid pixels at successive locations in each block, or calculating the sum of the numbers detected for respective blocks, as required by Claim 23. The ‘881 patent does not teach or suggest these limitations, and the Office Action is merely speculating when stating that such steps “can be” performed. Accordingly, for the reasons stated above, Applicant respectfully submit that a *prima facie* case of obviousness has not been established and the rejection of Claim 23 should be withdrawn.

Independent Claim 24 recites limitations analogous to those recited in Claim 23. Accordingly, for the reasons stated above, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 24 should be withdrawn.

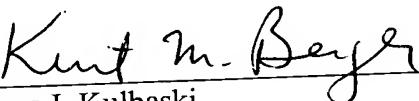
Independent 25 is directed to a computer readable medium storing a program configured to cause a computer to execute the method according to any one of claims 19 to 24. Accordingly, for the reasons stated above regarding independent Claims 19, 22, 23 and 24, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 25 should be withdrawn.

Thus, it is respectfully submitted that independent Claims 1, 8, 19, and 22-25 (and all associated dependent claims) patentably define over any proper combination of the cited references.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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